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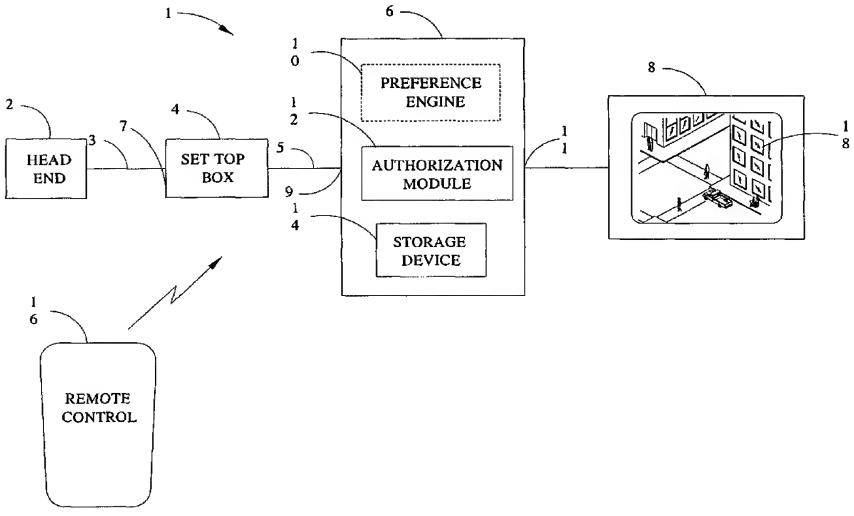
(54) Title: SYSTEM AND METHOD FOR RECORDING AND VIEWING CONDITIONALLY ACCESSIBLE VIDEO PROGRAMS



(57) Abstract: A system and method enable a viewer to record and view conditionally accessible video programs. The system has an input port (9) that receives a conditionally accessible video program and an output port (11) that is coupled to a video display (8). A storage device (14) records the conditionally accessible video program before an authorization is provided. An authorization module (12) is coupled to the storage device (14) and is configured to detect a viewer input that selects the conditionally accessible video program. The authorization module (12) determines whether the viewer has authorization to access the conditionally accessible video program. When the viewer has authorization to access the conditionally accessible video program, the authorization module (12) accesses and displays the recorded conditionally accessible video program.

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SYSTEM AND METHOD FOR RECORDING AND VIEWING CONDITIONALLY ACCESSIBLE VIDEO PROGRAMS

Background of the Invention

Field of the Invention

The invention relates to a system for receiving and displaying video data. More particularly, the invention relates to a system and method for recording and viewing conditionally accessible video programs.

Description of the Related Art

A conventional system for receiving and displaying video data includes a monitor or a television (TV) set connected to a set top box. The set top box is connected through a coaxial cable to a cable TV network or a satellite dish for "satellite TV." The TV set and the set top box are located in a viewer's home and receive a multitude of TV channels from a broadcast head end, wherein each TV channel has a multitude of programs during a typical day. In order to select and watch a certain program, the viewer usually uses a remote control to control at least the set top box to tune to a desired channel. The TV set receives a video signal from the set top box and displays the program of the desired channel.

The viewers often expand the system by connecting a video recorder between the TV set and the set top box in order to overcome the rigid time schedule according to which the programs are broadcast. Thus, a viewer can personalize television viewing by recording a program and watching it when it is convenient for the viewer. The video recorder may be a digital video recorder that includes a hard disk drive with a storage capacity of between 10 GB and 30 GB for recording of up to 30 hours of television programming.

Furthermore, the viewers often subscribe to and receive premium contents such as subscription channels, pay-per-view services or video-on-demand services in order to watch a movie on a certain day and at a time of day. For example, the viewers of a predetermined geographical area must sign up with a multiple-service operator that serves this geographical area. The multiple-service operator then supplies video programming to multiple users. If a viewer wants to watch one of the pay-per-view movies or one of the video-on-demand movies, the viewer must first order the selected video program and satisfy a condition for access. This condition is often the payment of a fee.

Providers of these services want to attract as many viewers as possible, which becomes difficult with increasing viewing options for the viewers. Furthermore, the viewers may consider it as an obstacle that the pay-per-view programs and the video-on-demand programs must first be ordered, which delays a viewer's viewing session. In addition, a selected pay-per-view program or a selected video-on-demand program may only be available at certain days and a certain time, thus limiting a viewer's options.

There is therefore a need to further improve upon the prior art technique of displaying video data in order to facilitate viewing of pay-per-view programs and video-on-demand programs.

Summary of the Invention

The present invention may be regarded as a method of displaying a video program which requires that an authorization be provided for viewing by a viewer. The method receives a conditionally accessible video program from a video program provider and records the conditionally accessible video program before an authorization is provided. Upon a viewer selecting the conditionally accessible program for viewing, the method determines whether the viewer has authorization to access the conditionally accessible video program. When the viewer has authorization to access the conditionally accessible video program, the method accesses and displays the recorded conditionally accessible video program.

The present invention may also be regarded as a system for recording and viewing conditionally accessible video programs which require that an authorization be provided for viewing by a viewer. An input port receives a conditionally accessible video program, and an output port is coupled to a video display. A storage device is coupled to the input port and to the output port and records the conditionally accessible video program before an authorization is provided. An authorization module is coupled to the storage device and is configured to detect a viewer input that selects the conditionally accessible video program. Upon a viewer selecting the conditionally accessible program for viewing, the authorization module determines whether the viewer has authorization to access the conditionally accessible video program. When the viewer has authorization to access the conditionally accessible video program, the authorization module accesses and displays the recorded conditionally accessible video program.

Brief Description of the Drawings

These and other aspects, advantages, and novel features of the invention will become apparent upon reading the following detailed description and upon reference to the accompanying drawings. In the drawings, same elements have the same reference numerals.

Figure 1 is a high-level block diagram of a system for recording and viewing conditionally accessible video programs in accordance with an embodiment of the present invention that includes a set top box and a digital video recorder connected to a display for displaying the conditionally accessible video programs.

Figure 2 is a flow chart of a method in accordance with an embodiment of the present invention that receives a conditionally accessible video program, records the conditionally accessible video program, and, upon determining that viewer has authorization to access the conditionally accessible video program, accesses and displays the recorded conditionally accessible video program.

Figure 3 is a more detailed illustration of the system for recording and viewing conditionally accessible video shown in Figure 1, wherein the digital video recorder includes a storage device and an authorization module configured to determine whether the viewer has authorization to access the conditionally accessible video program and to access and display the recorded conditionally accessible video program when the viewer has authorization.

Figure 4 is an illustration of a system for recording and viewing conditionally accessible video programs in accordance with a further embodiment of the present invention, wherein the digital video recorder is coupled to an external storage device and an interface, and wherein the system is configured for bi-directional communications.

Detailed Description of the Preferred Embodiment

Figure 1 is a high-level block diagram of a system 1 for recording and viewing conditionally accessible video programs in accordance with an embodiment of the present invention and suitable for practicing a method in accordance with the present invention. The system 1 includes a set top box 4, a remote control 16 and a digital video recorder 6 coupled to a display 8 for displaying a video program 18. The video program may be a conditionally accessible video program 18, such as a pay-per-view program or a video-on-demand program. The set top box 4 is coupled to a head end 2 via a link 3. The head end 2 transmits video programs to the set top box 4. The system 1 and its components are described below in more detail.

In one embodiment of the invention, the video program is displayed in accordance with a method of displaying a video program which requires that an authorization be provided for viewing by a viewer. The method is illustrated by a procedure shown in a flowchart in Figure 2. The procedure is initialized in a step 20, and then proceeds to a step 22.

In the step 22, the procedure receives a conditionally accessible video program 18 from a video program provider. The video program provider may be a multiple service operator (MSO) that operates the head end 2 and that transmits the conditionally accessible video program 18 in a non-viewable mode. The head end 2 serves as a source for the conditionally accessible video program 18. Further, the video program provider may be cable television system operator or a satellite television system operator.

Next, in a step 24, the procedure records the conditionally accessible video program 18 before an authorization is provided. In one embodiment, the digital video recorder 6 records the conditionally accessible video program 18 in the non-viewable mode.

Next, in a step 26, the procedure determines whether the viewer selects a conditionally accessible video program 18 for viewing. The procedure repeats the step 26 until the viewer makes a selection

Next, in a step 28, upon a viewer selecting the conditionally accessible program for viewing, the procedure determines the viewer's access authorization. The procedure determines from the viewer's access authorization whether the viewer has authorization to access the conditionally accessible video program 18. If the viewer does not have access authorization, the procedure waits at the step 28 until the viewer receives authorization.

Next, in a step 32, if the viewer has access authorization for the selected conditionally accessible video program 18, the procedure accesses and displays the recorded conditionally accessible video program 18. That is, the procedure converts the conditionally accessible video program 18 into a viewable mode only when the viewer has access authorization.

After displaying the conditionally accessible video program 18, the procedure ends in a step 34.

The method in accordance with the present invention provides for speculative recording of the conditionally accessible video program 18 on the viewer's digital video recorder 6 without advance commitment to pay for the conditionally accessible video program 18. Thus, at the time the digital video recorder 6 records the conditionally accessible video program 18, the viewer has no obligation to view the conditionally accessible video program 18 that is recorded in the non-viewable form. Further, it is not even known whether or not the viewer will in fact watch any of

the recorded conditionally accessible video programs 18. A recorded conditionally accessible video program 18 that the viewer has not selected will be automatically deleted after a predetermined time.

The recorded content of the digital video recorder 6 may be displayed as a menu on the display 8 from which the viewer may select a conditionally accessible video program 18 for viewing. The menu may include the titles, bibliographic data and summaries of the recorded conditionally accessible video program 18. However, the conditionally accessible video program 18 is only viewable when the viewer has authorization, for example, after the viewer has paid for the selected conditionally accessible video program 18.

The viewer may obtain authorization to access and display the conditionally accessible video program 18 in various ways. For example, the viewer may establish a preauthorized credit account, which is debited, every time the viewer wishes to access the conditionally accessible video program 18. The credit account may be debited locally through equipment in the viewer's home, or through communications between the equipment and the head end 2 that maintains the viewer's credit account. The equipment may include the set top box 2 or the digital video recorder 6, or both, and may include additional devices depending on how the viewer debits the credit account. In one embodiment, the set top box 2 may automatically send an authorization packet to the head end 2 via the link 3 when the viewer selects a conditionally accessible video program 18. Upon debiting the viewer's credit account, the head end 2 returns, for example, a "key" (e.g., a numerical code word) that the set top box 4 or the digital video recorder 6 uses to convert the conditionally accessible video program 18 into the viewable mode.

In another embodiment, the set top box 2 or the digital video recorder 6 may include a card reader that reads from a debit card or a credit card to charge the respective card the required fee for the selected conditionally accessible video program 18. Once the credit account is debited, the conditionally accessible video program 18 is converted into the viewable mode. For example, the head end 2 may send a "key" to the requesting equipment as described above. Alternatively, the card reader may "unlock" a local memory that stores a "key." The set top box 4 or the digital video recorder 6 may read the "key" from the unlocked memory and use it to convert the conditionally accessible video program 18 into the viewable mode. In yet another embodiment, the "key" may be stored on a smart card that serves as a debit card and as a storage device for the "key."

An advantage of speculatively recording the conditionally accessible video program 18 locally on the viewer's digital video recorder 6 is that the viewer has faster access to the

conditionally accessible video program 18. The head end 2 may transmit the conditionally accessible video program 18 during a period of low traffic, for example, between midnight and 5 a.m. In such cases, the recording of the conditionally accessible video program 18 does not interfere with the viewer's viewing habits or interfere with the viewer's usual use of the digital video recorder 6. Further, the viewer can watch the conditionally accessible video program 18 at any day and at any time independent from the head end 2, provided the viewer has authorization. This flexibility may increase the acceptance of the conditionally accessible video program 18 by the viewers.

Figure 3 is a more detailed illustration of the system 1 for recording and viewing a conditionally accessible video program 18 shown in Figure 1. Corresponding components of the system 1 have the same reference numerals. The system 1 has an input port 7 to receive the conditionally accessible video program 18 from the head end 2, and has an output port 11 coupled to the video display 8. A storage device 14 is coupled to the input port 7 and the output port 11 and is configured to record the conditionally accessible video program 18 before an authorization is provided. An authorization module 12 is coupled to the storage device 14 and is configured to detect a viewer input that selects the conditionally accessible video program 18. Upon a viewer selecting the conditionally accessible program 18 for viewing, the authorization module 12 determines whether the viewer has authorization to access the conditionally accessible video program 18. When the viewer has authorization to access the conditionally accessible video program 18, the authorization module 12 accesses and displays the recorded conditionally accessible video program 18.

The set top box 4 is coupled to the head end 2 via the link 3, wherein the link 3 is connected to the input port 7. In the illustrated embodiment, the input port 7 is both the input port of the system 1 within the viewer's home and the input port of the set top box 4. A link 5 connects the set top box 4 to an input port 9 of the digital video recorder 6 that includes the authorization module 12 and the storage device 14. The storage device 14 is coupled to the input port 9 and is thus coupled to the input port 7 via the set top box 4. Optionally, the digital video recorder 6 may include a preference engine 10 as indicated in dashed lines. The preference engine 10 is described below.

The set top box 4 and the digital video recorder 6 may be combined into a single apparatus. The apparatus then combines the functionalities of the set top box 4 and the digital video recorder 6 and has an input port (e.g., the input port 7) to receive the conditionally accessible video programs 18 and broadcast programs from the head end 2. The single apparatus

is then connected between the head end 2 and the display 8 and is controllable by a viewer using the remote control 16.

The head end 2 provides the conditionally accessible video programs 18 and the broadcast programs having audio and video data. The head end 2 transmits the conditionally accessible video programs 18 and the broadcast programs in a format that conforms to known video and television formats, such as NTSC, PAL, S-Video or the like. The set top box 4 therefore receives the conditionally accessible video programs 18 and the broadcast programs as analog signals from the head end 2. The head end 2 converts the conditionally accessible video programs 18 into the non-viewable mode to avoid unauthorized viewing. For example, the head end 2 may scramble the analog signal by inserting counterfeit synchronization pulses. The (regular) broadcast programs are usually not scrambled and are thus viewable without authorization.

In another embodiment, the head end 2 may transmit the conditionally accessible video programs 18 and the broadcast programs as digital signals. The digital signals may be encrypted to avoid unauthorized viewing. The set top box 4 is then configured to receive and to process (e.g., to decrypt) the digital signals.

The link 3 may be a conventional coaxial cable and may be part of a cable TV distribution network that serves a plurality of households. Further, it is contemplated that the link 3 between the set top box 4 and the head end 2 may be a wireless link, e.g., as part of a satellite TV network or a UHF/VHF TV network. Hereinafter, the set top box 4 is connected to the head end 2 through a conventional coaxial cable. In one embodiment, the system 1 is configured to provide for bi-directional communications between the set top box 4 and the head end 2 and between the set top box 4 and the digital video recorder 6. The links 3, 5 therefore have a physical back channel or a "virtual" back channel.

The digital video recorder 6 communicates with the set top box 2 through the link 5 that provides for analog or digital communications, or both. To enable digital communications, the link 5 may include an interface between the set top box 4 and the digital video recorder 6. In one embodiment, the interface conforms to the IEEE 1394 standard as described below. The storage device 14 may be a hard disk drive (HDD) that has a storage capacity of, for example, between 10 GB and 30 GB to selectively store, and thus record, digital information such as sequences of video data. That is, the storage device 14 may store up to 80 hours of compressed video and audio data. The compression is often achieved by using a standardized process defined by the Moving Picture Expert Group (MPEG), e.g., MPEG-2 or MPEG-4. The recorded video data is

then available for later reproduction when the viewer decides to watch the recorded video data and obtains authorization to access the conditionally accessible video program 18.

It is contemplated that in one embodiment, the digital video recorder 6 may be configured to perform the compression (e.g., MPEG-2 compression) and to selectively store the compressed video data. The digital video recorder 6 may also be configured to perform the corresponding decompression. In another embodiment, the system 1 may be configured so that the digital video recorder 6 receives already compressed video data from the set top box 4 that performs the compression or that receives the conditionally accessible video program 18 and the broadcast programs in compressed form from the head end 2. Regardless of the origin of the compressed video data, the storage device 14 selectively stores the compressed video data without requiring compression within the digital video recorder 6. The compressed video data may be decompressed outside the digital video recorder 6.

The system 1 with the set top box 4 and the digital video recorder 6 provides for various options for recording a conditional accessible video program 18. In one embodiment, the digital video recorder 6 receives the conditionally accessible video program 18 as an analog NTSC signal from the set top box 4. The analog NTSC signal is scrambled to be in the non-viewable mode as described above. The digital video recorder 6 is configured to receive the (scrambled) analog NTSC signal and to convert it into the viewable mode, i.e., to descramble the analog NTSC signal. In order to store the conditionally accessible video program 18 on the storage device 14, the digital video recorder 6 converts the analog NTSC signal into a digital signal and compresses the digital signal, for example, in accordance with the MPEG-2 standard.

Alternatively, the digital video recorder 6 may compress the scrambled analog NTSC signal. The compressed and stored signal corresponds to the scrambled analog NTSC signal. To recover the stored signal, the digital video recorder 6 processes the stored signal in reverse order (i.e., decompression first and then descrambling).

Further, instead of descrambling the analog NTSC signal in the digital video recorder 6, the set top box 4 may include circuitry to descramble the analog NTSC signal. The conditionally accessible video program 18 is then in the viewable mode. To avoid unauthorized interception by a viewer, the set top box 4 may process the analog NTSC signal as described below.

In one embodiment, the set top box 4 converts the descrambled analog NTSC signal into a digital signal. In order to protect and avoid unauthorized access to the conditionally accessible video program 18, the set top box 4 encrypts the digital signal in accordance with known encryption techniques. The set top box 4 may also perform the compression of the (encrypted)

digital signal. The digital video recorder 6 receives the digital signal, which may be compressed and encrypted, from the set top box 4 via the link 5 that includes, for example, an interface in accordance with the IEEE 1394 standard.

Alternatively, the digital video recorder 6 records the digital signal in decrypted form. The digital video recorder 6 is configured to send a request to the set top box 4 to provide a decrypted version of the digital signal. The set top box 4 decrypts the digital signal by accessing a locally stored "key" or by requesting a "key" from the head end 2.

Further, the digital video recorder 6 may decrypt the digital signal. The "key" can be requested from the set top box 4 or the "key" can be obtained by having the set top box 4 send a request to the head end 2.

To encrypt and decrypt the conditionally accessible video programs 18 known cryptographic methods may be used. The cryptographic methods may apply public keys and secret keys. An example of a commercially available cryptographic product is PowerKey from Scientific Atlanta. Another example of an available product is DigiCipher II from General Instruments.

To access the recorded conditionally accessible video program 18, the authorization module 12 is coupled to the storage device 14 and is configured to receive viewer input. The authorization module 12 is part of the control mechanism of the system 1 and controls the access to the conditionally accessible video program 18. For example, during the initialization procedure when the viewer activates the display 8 and the set top box 4, the control mechanism determines whether the set top box 4 is operating and is properly connected to receive the conditionally accessible video program 18 from the head end 2. The control mechanism also determines how much storage capacity is available on the storage device 14. If necessary, the control mechanism deletes recorded conditionally accessible video programs 18 that the viewer has not selected for the predetermined time.

The authorization module 12 may be configured to provide authorization and access to the conditionally accessible video program 18 in accordance with the options described with reference to Figure 2. For instance, the authorization module 12 may debit the fee from a preauthorized credit account, request a "key" from the head end 2, access a locally stored "key," or read the "key" from a smart card.

Figure 4 illustrates a system 100 for displaying video data in accordance with another embodiment of the present invention. The system 100 has generally the same structure as the system 1, but further includes an external storage device 114 coupled to the digital video

recorder 6 and an interface (IF) 102 coupled between the digital video recorder 6. It is contemplated that the digital video recorder 6 includes appropriate interface circuitries to communicate with the external storage device 114. The interface circuitries allow the digital video recorder 6 to communicate with the external storage device 114 and to scan and read the available conditionally accessible video program. In one embodiment, the interface circuitries are the same as the interface 102.

The head end 2 is coupled to the set top box 4 through a connection 106 and a connection 104 that allow bi-directional communications between the head end 2 and the set top box 4. It is contemplated that the connections 104, 106 may be combined as a single connection. The connection 106 conveys the conditionally accessible video program 18 and broadcast program to the set top box 4. The connection 104 provides a back channel that allows the set top box 4 to send requests to the head end 2, for example, to verify authorization and to request a key.

The set top box 4 is coupled to the digital video recorder 6 through a connection 108 and through a connection formed by buses 110, 112 and the interface 102. The digital video recorder 6 receives the conditionally accessible video program 18 and the broadcast programs as analog signals in accordance with known TV and video formats (e.g., NTSC). The digital video recorder 6 may include circuitry, such as an MPEG-2 encoder, to compress the conditionally accessible video program 18 for storing on the storage devices 14, 114. The connection formed by the buses 110, 112 and the interface 102 convey digital signals between the set top box 4 and the digital video recorder 6. For illustrative purposes, Figure 4 shows the interface (IF) 102 coupled to the set top box 4 and to the digital video recorder 6. However, it is contemplated that the functionality of the interface 102 may be included in one of the set top box 4 and the digital video recorder 6, or in both. The interface 102 forwards, for example, electronic program guide information to the digital video recorder 6. In an embodiment in which the viewer uses the remote control 16 to control only the set top box 4, the interface 102 also forwards commands from the viewer to the digital video recorder 6. Such commands include commands generated when the viewer selects one of the conditionally accessible video programs 18 for viewing.

The interface 102 forwards requests from the digital video recorder 6 to the set top box 4 to obtain authorization for accessing the conditionally accessible video program 18 as described above. In one embodiment, the interface 102 is compatible with the specification for a universal serial bus (USB), e.g., USB 2.0, or the IEEE 1394 standard, which is described in the "IEEE Std 1394-1995 IEEE Standard for a High Performance Serial Bus," August 30, 1996,

which is incorporated by reference herein. The interface 102 may include capabilities to encrypt the digital signals before they are recorded onto the storage devices 14, 114 to provide protection from unauthorized copying or transporting of stored video data by exchanging external rotating storage devices 114 between different video recording systems 100.

In one embodiment, the storage devices 14, 114 are hard disk drives that are compatible with the IEEE 1394 standard. Alternatively, the external storage drive 114 may be a writable digital video disk (DVD) drive, or another technology that provides for writable non-volatile storage. A full storage device 114 can be disconnected and replaced with an empty storage device 114. Thus, the video system 100 provides nearly unlimited storage capacity.

In one embodiment, the system 1 and the system 100 include the preference engine 10 which is located within the digital video recorder 6. Because the preference engine 10 is optional, Figures 3 and 4 show the preference engine 10 in dashed lines. The preference engine 10 is coupled to the input port 9 and is thus coupled to the input port 7 via the set top box 4. The preference engine 10 is configured to track viewer selections of the broadcast programs and to create a viewer profile. The preference engine 10 is further coupled to the storage device 14.

The preference engine 10 is a software module that learns a viewer's watching preferences by monitoring the viewer's viewing patterns. The preference engine 10 uses the viewing patterns to create a viewer profile which may be stored on the storage device 14. Thus, the preference engine 10 narrows the multitude of programs down to a reasonable number of program choices based upon the viewer's actual viewing patterns. One embodiment of the preference engine 10 is a software module that is commercially available from Metabyte Networks, Inc.

The preference engine 10 may further influence the recording of the conditionally accessible video program 18. The digital video recorder 6 may be configured to record conditionally accessible video programs 18 in accordance with the viewer profile. That is, the digital video recorder 6 records only conditionally accessible video programs 18 that match the viewer profile. The storage device 14 thus includes only conditionally accessible video programs 18 that have a high probability of acceptance by the viewer.

The preference engine 10 may use an electronic program guide transmitted by the head end 2 to create the viewer profile. The electronic program guide is a database containing information regarding the broadcast schedules for various video program segments from various broadcast channels. This information is typically expressed in the form of a program

grid with columns denoting the time periods and with separate rows for each of the available broadcast channels.

The viewer can control the system 1 through the remote control 16. As illustrated in Figures 3 and 4 by way of example, the remote control 16 communicates with the set top box 4 via a wireless link conveying control signals using infrared (IR) light. Remote controls and their various functions are generally known in the art. In particular, it is known that IR light is modulated with a specific command, e.g., channel up or down, volume up or down, and the like, and that the controlled device detects and processes the modulated IR light to execute the command in the controlled device. Further, it is known that a remote control can control more than one device, e.g., a television set and the set top box 4.

WHAT IS CLAIMED IS:

1. A method for recording and viewing conditionally accessible video programs which require that an authorization be provided for viewing by a viewer, the method comprising:

receiving a conditionally accessible video program from a video program provider;

recording the conditionally accessible video program before an authorization is provided;

upon a viewer selecting the conditionally accessible program for viewing:

determining whether the viewer has authorization to access the conditionally accessible video program; and

when the viewer has authorization to access the conditionally accessible video program, accessing and transmitting the recorded conditionally accessible video program to a display.

2. The method of Claim 1, wherein the video program provider is a cable television system operator.

3. The method of Claim 1, wherein the video program provider is a satellite television system operator.

4. The method of Claim 1, wherein the received conditionally accessible video program is in a non-viewable mode.

5. The method of Claim 1, wherein the received conditionally accessible video program is a scrambled analog signal.

6. The method of Claim 1, further comprising descrambling the conditionally accessible video program and compressing the descrambled conditionally accessible video program prior to recording.

7. The method of Claim 1, wherein the received conditionally accessible video program is an encrypted digital signal.

8. The method of Claim 1, further comprising decrypting the digital signal and recording the decrypted digital signal.

9. The method of Claim 1, further comprising recording the encrypted digital signal.

10. The method of Claim 1, further comprising decrypting the encrypted digital signal upon obtaining authorization to access the conditionally accessible video program.

11. The method of Claim 1, further comprising detecting a viewer input to obtain authorization to access the conditionally accessible video program.

12. The method of Claim 1, further comprising obtaining a key upon obtaining authorization to access the conditionally accessible video program and processing the conditionally accessible video program to convert the conditionally accessible video program into a viewable mode.

13. The method of Claim 1, wherein obtaining the key includes requesting the key from a source of the conditionally accessible video program.

14. The method of Claim 1, wherein obtaining the key includes retrieving the key from a local memory.

15. The method of Claim 1, further comprising enabling reading from the local memory upon obtaining authorization to access the conditionally accessible video program.

16. The method of Claim 1, further comprising debiting a fee from a preauthorized credit account.

17. The method of Claim 1, wherein the preauthorized credit account is maintained at a source of the conditionally accessible video program.

18. The method of Claim 1, wherein the preauthorized credit account is maintained locally.

19. A system for recording and viewing conditionally accessible video programs which require that an authorization be provided for viewing by a viewer, comprising:

an input port configured to receive a conditionally accessible video program;

an output port configured to couple to a video display;

a storage device coupled to the input port and the output port and configured to record the conditionally accessible video program before an authorization is provided; and

an authorization module coupled to the storage device and configured to detect a viewer input that selects the conditionally accessible video program, and upon a viewer selecting the conditionally accessible program for viewing, to determine whether the viewer has authorization to access the conditionally accessible video program; and when the viewer has authorization to access the conditionally accessible video program, accessing and transmitting the recorded conditionally accessible video program to a display.

20. The system of Claim 1, wherein the storage device and the authorization module are comprised in a digital video recorder.

21. The system of Claim 1, wherein the digital video recorder further comprises a preference engine configured to track viewer selections and to create a viewer profile for selecting a conditionally accessible video program for recording.

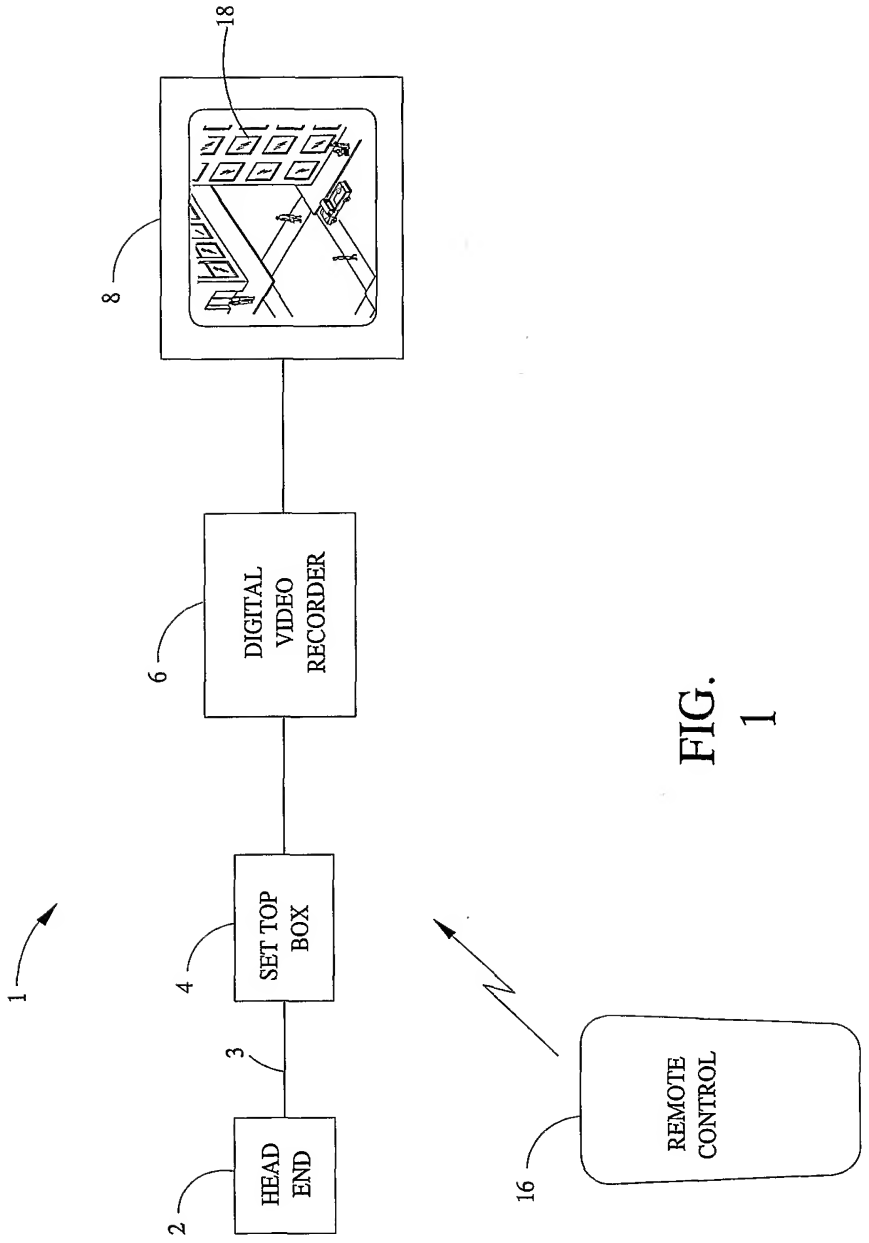
18
8
DIGITAL VIDEO RECORDER
6
SET TOP BOX
4
3
HEAD END
2
1
REMOTE CONTROL
16

FIG. 1

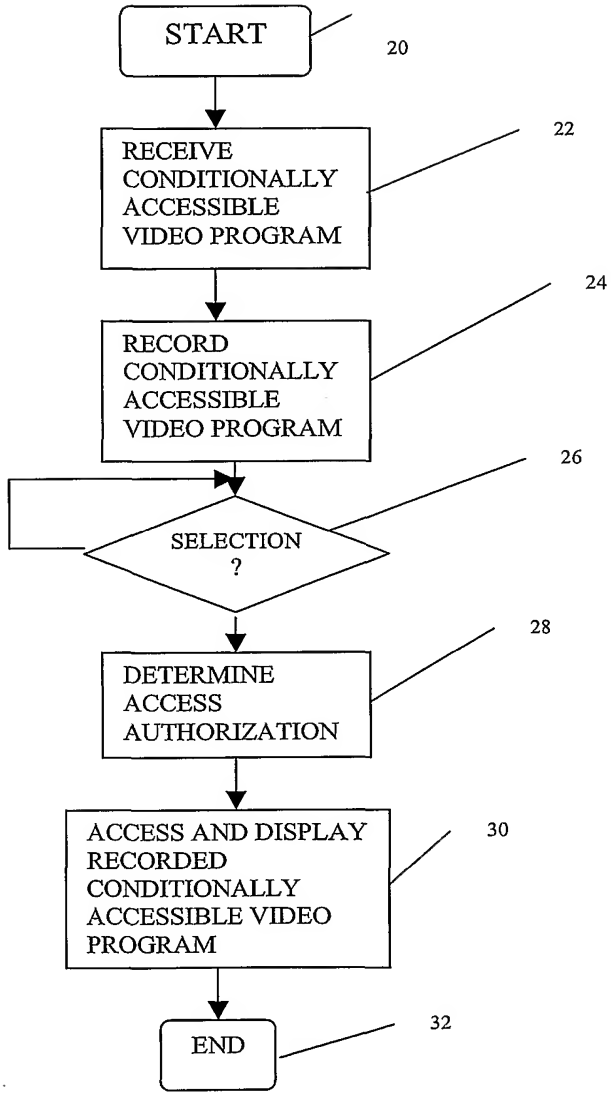
START
20
RECEIVE CONDITIONALLY ACCESSIBLE VIDEO PROGRAM
22
RECORD CONDITIONALLY ACCESSIBLE VIDEO PROGRAM
24
SELECTION ?
26
DETERMINE ACCESS AUTHORIZATION
28
ACCESS AND DISPLAY RECORDED CONDITIONALLY ACCESSIBLE VIDEO PROGRAM
30
END
32

FIG. 2

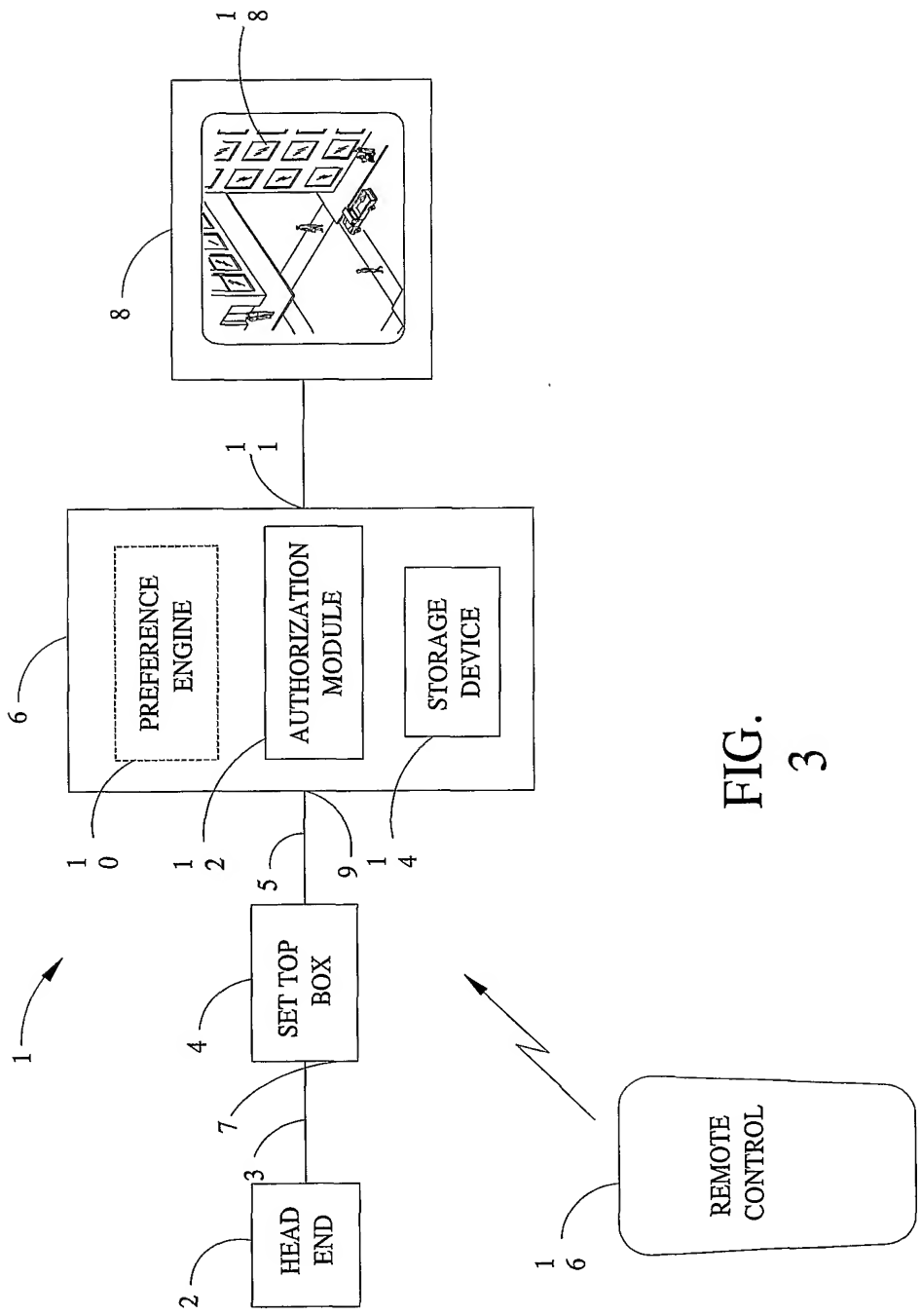
1
8
8
1
1
6
PREFERENCE ENGINE
AUTHORIZATION MODULE
STORAGE DEVICE
1
0
1
2
5
9
1
4
1
4
SET TOP BOX
7
3
2
HEAD END
1
6
REMOTE CONTROL

FIG. 3

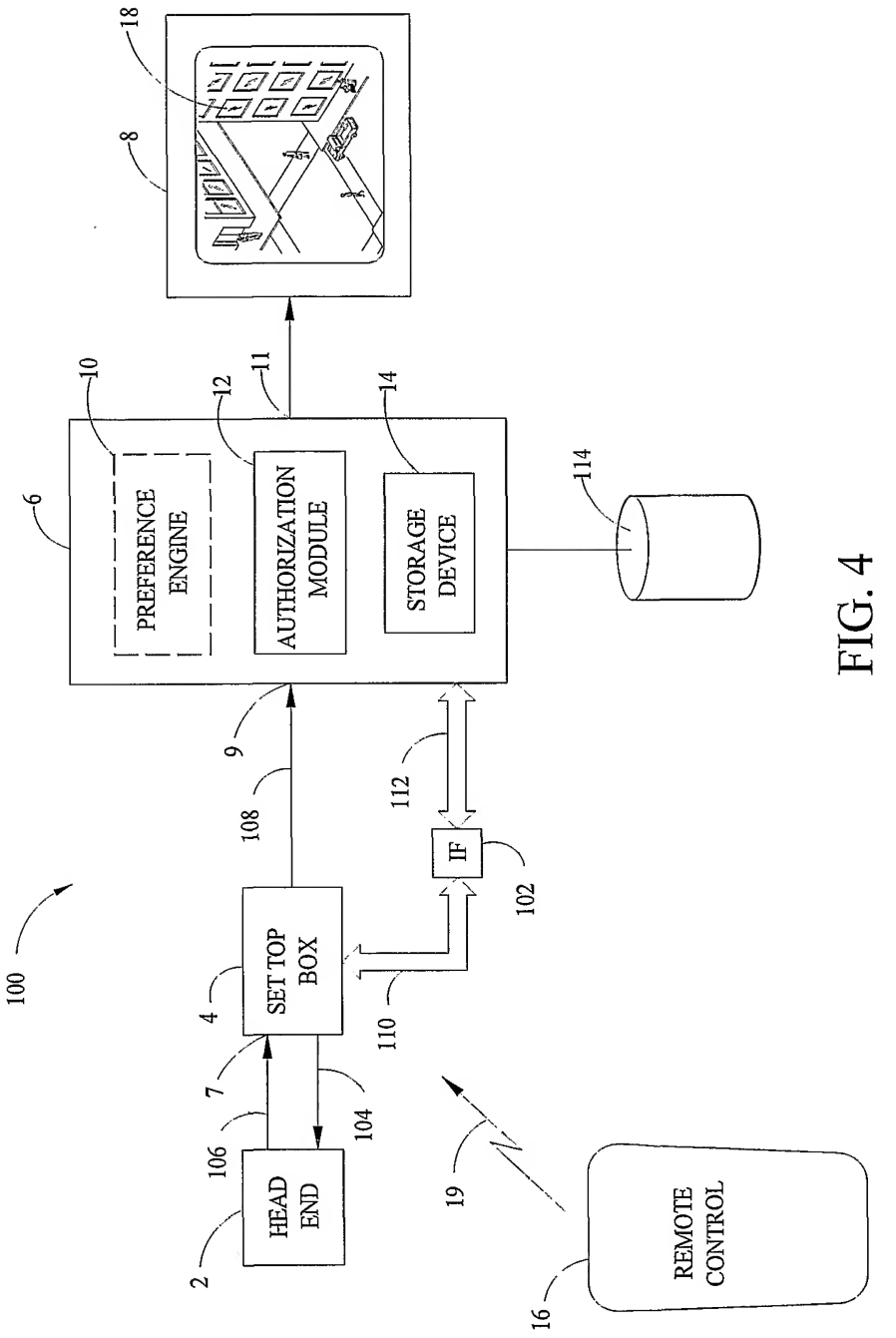
18
8
10
12
11
14
6
PREFERENCE ENGINE
AUTHORIZATION MODULE
STORAGE DEVICE
114
9
108
112
IF
102
100
4
SET TOP BOX
110
7
106
104
19
2
HEAD END
16
REMOTE CONTROL

FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/30169

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) : H04N 7/167
US CL : 380/231, 233, 241
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 380/231, 233, 241

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,862,299 A (LEE et al.) 19 January 1999, column 2, lines 37-58 and column 4, lines 13-22.	1-21
A	US 5,815,671 A (MORRISON) 29 September 1999, column 2, line 11 through column 4, line 13.	1-21

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
09 December 2001 (09.12.2001)	02 JAN 2002
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703)305-3230	Authorized officer Gail O. Hayes Telephone No. (703) 306-5617

Form PCT/ISA/210 (second sheet) (July 1998)